



An Exploratory Analysis of Existing Dairy Farming Practices Followed by Tribals in Madhya Pradesh State

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Abstract

Livestock rearing happens to be an integral part of the livelihood of tribal households and to the broad rural economy since ancient times and have been contributing enormously in socio-economic development of millions of households and national economy. Integration of dairy component along with crop farming provides livelihood security to the tribal farmers. The present study was undertaken in two districts from most tribal populated area of Madhya Pradesh State (i.e. Jhabua and Dhar). From each district two blocks and from each block/tehsil two villages were selected randomly. Thus, a total of eight villages were selected and from each selected village 15 respondents were randomly selected. Overall, a total of 120 respondents were selected for the study. The salient findings of the study highlighted that, majority (53.33%) of the tribal farmers were able to identify the heat symptoms in animals by the bellowing and mounting of dairy animals, around 40 per cent fed dry fodder like maize, bajra, jowar etc. A large majority (80 %) was not vaccinating their animals against diseases like F.M.D, H.S and B.Q. and almost 60% of the respondents were practicing the knuckling method of milking. The study also suggests facilitating training and extension activities among dairy farmers to create more awareness regarding improved dairy farming practices among tribal farmer.

Keywords: Animals, Dairy, Farming, Practices, Tribal

Introduction

Tribals are historically a disadvantaged and economically a backward people. They have been at the lower end in all indicators of living conditions and household assets (Bhagat, 2013). Their characteristics include rural-oriented, illiteracy, economic backwardness such as lower income, higher incidence of indebtedness and fewer assets among others and social retardation such as low status (Hanumantha and Grover, 1979). The main constraints faced by the majority of tribals in the participation of different on-farm activities were lack of irrigation facility, unavailability of agricultural labour and high labour charges and lack of training facility for farming. While, with regard to off-farm activities major constraints faced by the respondents were lack of proper knowledge about different off-farm activities, lack of training facility in tribal area for skill development related to different off-farm activities, poor economic status of tribes and lack of transportation facility in tribal area (Shandilya *et al.*, 2016). In India, Scheduled Tribes constitute 8.6 percent of total population numbering 104.28 million (Census Report, 2011). Some of the major tribal groups in India include Gonds, Bhils, Santhals, Khasis, Angamis, Bhutias and Great Andamanese. Livestock contribute to food, economical, environmental, institutional, health, educational, social, infrastructural, nutritional security; and thus, in total to the livelihood security of the tribes by providing transport and on-farm power. Livestock manure helps in preserving soil fertility; and they fulfill a wide range of socio-cultural characters of tribes. Among the livestock systems, dairy farming plays significant role in nourishing the rural livelihoods. Apart from the dairy animals like cattle and buffaloes, other including sheep, goat, pig and poultry are also very important species of livestock production system of the tribes.

However, past studies have highlighted several existing dairy farming practices adopted by tribal farmers. In case of breeding practices, a study conducted in Rajasthan revealed that, large majority (90.00%) of tribal respondents resorted to natural service; and only 10.00 per cent of them adopted artificial insemination (A.I.) in Dungarpur district (Yadav *et al.*, 2016). Further, it was observed that the cattle owners detected heat by identified symptoms like bellowing, mounting on other animals, nudging and frequent urination (Srivastava, 1982). Provision of proper feeding is an important aspect to meet the nutritional requirement of the cattle animals/herd. It was observed that grazing was most common practice followed by respondents in the tribal areas of India. Besides grazing, paddy straws, wheat straw, maize straw, grasses and tree leaves were also fed to the animals as green fodder (Kokate, 1984). In case of healthcare practices, several studies revealed that cutting of navel cord in case of new born calves was not practiced by majority of the tribal farmers, and it was left to fall off itself (Khatik, 1994) however; it was observed that jaggery (gur) dissolved in water was given to the animals just after calving. Also, majority of the tribal dairy farmers isolated the animals, when they became sick and got their animals vaccinated timely (Nagaraju, 2001). It was also reported that majority (56.33%) of the tribal farmers of Shevaroyan hill region of Tamil Nadu vaccinated their animals against F.M.D. (Foot and Mouth Disease), followed by 40.00 per cent against B.Q. (Black Quarter) and 26.67 per cent against H.S. (Haemorrhagic Septicaemia) but on the other side, majority (73.67%) of the respondents did not follow the practice of deworming animals (Das, 2006). Another study revealed that majority (61.67%) of the tribal respondents were using knuckling method for milking, followed by 25.33 per cent of them adopted stripping and only 13.00 per cent of them followed full hand milking, respectively (Chauhan *et al.*, 2004). Tribals also practiced indigenous methods and it was found that Toda tribe of Nilgiri regions fed droppings of pigeons along with the concentrate feed to bring the male buffalo into heat (Karthikeyan and Chandrakandan, 1996). Therefore, the evidences from several studies revealed that effective management of any dairy farm basically relied upon proper breeding, feeding, health-care and management practices adopted by the dairy farmers. In, view of this, the study was focused to highlight and explore the existing dairy farming practices followed by the tribes of Madhya Pradesh State.

Material and Methods

The study was carried out in Madhya Pradesh state. Two districts from the most 'Bhil' tribe populated districts of Madhya Pradesh (*viz.* Jhabua and Dhar) were selected, purposively; From each district two blocks and from each block/tehsil two villages were selected randomly. Thus, a total of eight villages were selected and from each selected village 15 respondents were randomly selected. Overall, a total of 120 respondents were selected for the study. Data were collected with the help of a pre-tested interview schedule, which was well structured and prepared on the basis of specific objectives of the study, in order to collect the required information. Existing dairy farming practices was operationally defined as the prevailing dairy farming practices being followed by the tribals dairy farmers, along with indigenous technical knowledge, in different aspects of dairy farming. The existing dairy farming practices were accessed in 4 broad categories *viz.* breeding, feeding, management and healthcare practices. The statistical

tools used for the analysis of the results were indicated in frequency and percentages.

Result and Discussion

The results highlighted the existing dairy farming practices accessed at 4 broad dimensions *viz.* breeding, feeding, management and healthcare practices.

Breeding Practices

A perusal of Table 1 showed that slightly less than half (48.33%) of tribal dairy farmers were having indigenous cattle and buffaloes, followed by those having indigenous cattle (37.50%) and buffaloes (14.17%), respectively. It could be concluded from the study that the area is dominated by indigenous cattle because of their ability to survive with low quality feed, fodder and water, coupled with such cattle's relatively less susceptibility to diseases. Further, it could be revealed from the study that majority (53.33%) of tribal dairy farmers had the ability to identify heat symptoms in animals by bellowing and mounting, followed by those identifying through bellowing as well as mounting (17.50%), bellowing and mucous discharge (16.67%), and mucous discharge (12.50%), respectively. The traditional knowledge helped them a lot in identifying heat symptoms. The findings are in accordance with the observation of Singh *et al.* (2015) and Vahora *et al.* (2016). Also, with regard to pregnancy diagnosis, it was found that majority (56.67%) of the respondents were having the ability to diagnose pregnancy in animals by seeing increased size of belly, followed by those diagnosing through urine colour (38.33%) and cessation of heat (5.00%), respectively. In case of artificial insemination, it was evident that none had adopted artificial insemination (A.I.). This might be due to lack of A.I. facilities in these areas and/or some respondents might be using natural service.

Table 1: Distribution of respondents according to existing breeding practices (n=120)

Existing Breeding Practices	Frequency	Percentage
Selection of Animal		
Indigenous cattle	45	37.5
Buffalo	17	14.17
Indigenous cattle + Buffalo	58	48.33
Identification of Animals in Heat		
Bellowing	21	17.5
Bellowing + Mounting	64	53.33
Mucous discharge	15	12.5
Bellowing + Mucous discharge	20	16.67
Pregnancy Diagnosis		
Increased belly size	68	56.67
Urine colour	46	38.33
Cessation of heat	6	5
Artificial Insemination		
Yes	-	-
No	120	100

Feeding Practices

From Table 2, it is evident that 72.50 per cent of the respondents were feeding colostrum immediately after the birth of calves; and 27.50 per cent of the respondents were feeding colostrum to the new born calves, when the calves were able to stand on their feet. This might be due to the apprehension that colostrum may not be easily digestible for the new born calves and/or majority might not have realized the importance of early feeding of colostrum. In case of feeding of dry fodder, it was found that 39.17 per cent of the respondents were feeding other feeds (maize, jowar, bajra, khejri, babul, ber etc.) followed by those feeding wheat straw (22.50%), and wheat straw as well as paddy straw (21.67%), and paddy straw (16.67%) to their animals, respectively. This might be due to the fact that wheat was the major cereal crop being grown in the study area, and was available to majority of the respondents.

With regard to feeding of green fodder, majority (85.83%) of the respondents were feeding green fodder to their animals sometimes. However, the rest (14.17%) of the respondents were feeding it regularly. This might be due to non-availability of green fodder for majority of the respondents. They used to feed tree leaves to their dairy animals, when green fodder was not available. In case of concentrate feeding, majority of the respondents (53.33%) were feeding other grains (jowar, bajra etc.), followed by those feeding crushed maize as well as mustard cake (24.17%), crushed maize (20.83%) and mustard cake (1.67%), respectively. This might be due to the fact that other grains were easily available as agro-byproducts to most of the respondents. Further the study highlighted that huge majority (93.33%) of the tribal respondents were following stall feeding as well as grazing, whereas 6.67 per cent of them were practicing stall feeding only. This might be due to the fact that the farmers having more income were mostly practicing stall feeding, while those having less income adopted grazing to supplement the lack of feeds and fodders as well as to satisfy the hunger of their animals. The findings are in accordance with the observations of Eqbal *et al.* (2013) and Sabapara *et al.* (2010). However; vast majorities (92.50%) of the respondents were not feeding mineral mixtures to their animals, as only a limited percentage (7.50%) of the respondents were feeding it. This might be attributed to the fact that the majority of the respondents might not be aware of the importance of mineral mixture and/or it might be costly for them.

Table 2: Distribution of respondents according to existing feeding practices (n=120)

Existing Feeding Practices	Frequency	Percentage
Colostrum Feeding to New-Born Calves		
Immediately after birth	87	72.5
When the new born calf is able to stand	33	27.5
Feeding of Dry Fodder		
Wheat straw	27	22.5
Paddy straw	20	16.67
Wheat straw + Paddy straw	26	21.67
Others (maize, jowar, bajra, babul, ber etc.)	47	39.17
Feeding of Green Fodder		
Regularly	17	14.17
Sometimes	103	85.83
Feeding of Concentrate		
Crushed maize	25	20.83
Mustard cake	2	1.67
Crushed maize + Mustard cake	29	24.17
Other grains (bajra, jowar etc.)	64	53.33
Method of Feeding		
Stall feeding	8	6.67
Stall feeding + grazing	112	93.33
Feeding of Mineral Mixture		
Yes	9	7.5
No	11	92.5

Management Practices

In case of housing of animals, majority (70.00%) of the respondents had separate animal shed; while 18.33 per cent of the respondents were keeping their animals inside their houses, and a lesser percentage (11.67%) of them were keeping their animals under the shade of a tree or open space. This might be due to the fact that most of the respondents had not enough land for separate animal shed, and/or it might be costly for them to have separate animal shed. The study further indicated that majority of the tribal respondents (85.83%) followed the practice of burial of the placenta. The remaining ones (14.17%) were throwing it. This might be due to the fact that majority of them might be aware of proper method for disposal of placenta. With regard to, cutting of navel cord, majority (90.83%)

of the tribal respondents were not practicing proper method of cutting of navel cord. They left the navel cord to fall off on its own in few days via drying off. Only a limited percentage (9.17%) of them was following proper method of navel cutting. Majority of the respondents might be following their traditional practices. The Table 3 also showed that almost all the respondents were not following dehorning of their calves. This might be due to the fact that they were not aware of the importance of dehorning and/or not feeling the necessity of dehorning practice.

Table 3: Distribution of respondents according to existing management practices (n=120)

Existing Management Practices	Frequency	Percentage
Housing of Animals		
Separate shed for animals	84	70
Under the shade of a tree/open space	14	11.67
Tie the animals inside home	22	18.33
Disposal of Placenta		
Buried	103	85.83
Thrown	17	14.17
Cutting of Navel Cord		
Yes	11	9.17
No	109	90.83
Deworming with Veterinary Medicines		
Yes	26	21.67
No	94	78.33
Dehorning		
Yes	-	-
No	120	100
Castration		
Yes	108	90
No	12	10
Method of Milking		
Full hand	34	28.33
Knuckling	72	60
Stripping	14	11.67
Cleaning of Udder Before Milking		
Regularly	24	20
Sometimes	81	67.5
Not followed	15	12.5
Washing Hands before Milking		
Yes	39	32.5
No	22	18.33
Sometimes	59	49.17

Majority (90%) of the tribal dairy farmers was not following the practice of castration; however, the rest of them (10%) were following castration. This might be due to their misconception that castration makes the animal weak. In case of method of milking, majority (60.00%) of the respondents were practicing 'knuckling method' of milking. 'Full hand' method of milking was being practiced by 28.33 per cent of the respondents and remaining 11.67 per cent respondents followed 'stripping method' of milking. Tribal farmers were mostly using knuckling method of milking, as they knew that other methods of milking were injurious to the animal and may cause teat injury. However, a majority (67.50%) of the respondents sometimes followed the practice of cleaning of udder before milking. Around 20 per cent of them were cleaning the udder, prior to milking and remaining 12.50 per cent were

not following. It can be concluded that majority of the respondents might not be well aware of the importance of cleaning of udder for hygienic milk production as well as removal of dust and dirt from the udder and teats. The table also depicted that almost half (49.17%) of the respondents were sometimes washing hands before milking; while the rest (32.50%) of the respondents were washing hands before milking and remaining were not washing hands before milking. This might be due to the fact that majority of the respondents were not aware of the importance of washing hands for clean milk production to avoid any sort of contamination.

Health-care Practices

Results presented in Table 4 indicated that most common disease of the area as reported by the respondents was F.M.D (100%), followed by those reporting about parasitic infections (85.00%), and mastitis (83.83%), digestive disorders (54.16%) respectively. This could be due to the fact that the majority might not have vaccinated their animals against F.M.D and/or the respondents were not following good hygienic practices as well. In case of vaccination, majority (79.17%) of the respondents were not vaccinating their animals against diseases, like F.M.D, H.S. and B.Q. The vaccination facility might not be available in most of the areas and the respondents were also not aware regarding this. The same constraints were also expressed by Meena & Meena (2012), Mooventhan *et al.* (2016) and Mohapatra *et al.* (2012). A limited percentage (20.83%) of them, were vaccinating their animals. Further, it was found that most (39.17%) of the tribal dairy farmers were using their indigenous technical knowledge (ITK) and treating their animals themselves. Only 29.17 per cent of them were seeking help of a veterinarian and 28.33 per cent respondents treated their animals with the help of local priest (Bhagat). While a significant percentage (20.83%) of them were taking the help of Para-vets. Further, it was found that majority (81.67%) of the respondents were not isolating the sick animals from the healthy ones. Only 18.33 per cent of them were following the practice of separation of sick animals from the others. This might be due to lack of enough space as well as lack of knowledge regarding transmission of contagious diseases. However, with regard to the disposal of dead animals, majority (55.00%) of the tribal respondents were throwing the dead animals, followed by those burying the dead animals (31.67%), and giving the dead body to the carcass collector (13.33%). It can be concluded from the study that majority might be aware of the proper method of disposal of dead animals and/or due to lack of awareness, they might have been throwing it, which can be the source of several infectious diseases.

Table 4: Distribution of respondents according to existing health care practices (n=120)

Existing health care practices	Frequency	Percentage
Common diseases/disorders among dairy animals		
F.M.D	120	100
Mastitis	97	83.83
Ecto-parasite/Endo-parasite infestations	102	85
Digestive disorders	65	54.16
Vaccination		
Yes	25	20.83
No	95	79.17
Treatment of diseases		
By local Priest	34	28.33
Self treatment	47	39.17
By Veterinarians	35	29.17
Para-vets	4	3.33
Isolation of sick animals		
Yes	22	18.33
No	98	81.67
Disposal of dead animals		
Buried	38	31.67
Thrown	66	55
Given to carcass collector	16	13.33

Indigenous technical knowledge, local knowledge and traditional practices are identical words used interchangeably. Local knowledge, in the sense, that is resulting from the direct experience of tribal farmers and which is limited to a particular place/location but its sustainability in other localities is not known. This has been gathered by the people over generations by observation and experimentation and traditional wisdom in any particular

human endeavor (Odhiambo and Kamp, 1990). Some of the Indigenous Technical Knowledge, which was being used by the respondents against many diseases and disorders in the study area, has been presented in the Table 5.

Table 5: Indigenous Technical Knowledge (ITK) practices followed by tribal farmers

S. No.	Practices
A	For increasing milk production
1	Churi Bata; Bajra (Pearl Millet, <i>Pennisetum spp.</i>), Gur (Jaggery), Ajwain (Carom Seed, <i>Trachyspermum spp.</i>), Mustard cake (<i>Brassica spp.</i>) and Coconut (<i>Cocos nucifera</i>) mixed all the gradient together and given to animals (after calving)
B	Indigestion
2	500g Ajwain (<i>Trachyspermum ammi</i>), 100g common salt, 100g Kalijeera (<i>Bunium persicum</i>), 50g black salt and 500g Ginger/Adrak (<i>Zingiber officinale</i>) mixed, crushed and divided into eight doses, one dose is given daily for one week
C	Diarrhoea
3	Salt and sugar dissolve in 1:2 ratio in water, drench the animal 3 times a day for 3 days
D	Foot and Mouth Disease (FMD)
4	Neem (<i>Azadirachta indica</i>) extract on the diseased region
5	Bark of Babool (<i>Vachellia nilotica</i>) boiled in water and use on the diseased region
6	Salt solution used with the help of cotton cloth inside the mouth and in the middle of hooves of the animal
7	Animals are made to walk in mud for controlling foot lesions; white alum is rubbed on tongue in mouth lesions
E	Wound
8	Wash wound along with boiled Neem (<i>Azadirachta indica</i>) leaves and use the Banana (<i>Musa paradisiaca</i>) leaf ash to stop the bleeding
9	Fresh cow dung blend with water used on the wounds
10	<i>Centella asiatica</i> has been reported to have been used for various medicinal purposes such as for wound healing
F	Tick infestation
11	Neem (<i>Azadirachta indica</i>) leaves paste applied on the body of the animal
12	Kerosene oil used on the body of the animal
13	Tamarind (<i>Tamarindus indicus</i>) extract strewed on the body of the animal
G	Fever
14	Leaves of Eucalyptus (<i>Eucalyptus regnus</i>) boiled for 20 minutes and given 1 liter twice a day
15	50 g Gur(Jaggery), 50 g Clove (<i>Syzygium aromaticum</i>), 50 g Ajwain (Carom seed, <i>Trachyspermum ammi</i>) 50 g Ginger (<i>Zingiber officinale</i>), 10 pieces of Black pepper (<i>Piper nigrum</i>) and 50 g Methi (Fenugreek, <i>Trigonella foenumgraecum</i>) mixed in 1 litre water and feed to animals
16	Massage of the body with warm mustard oil and Garlic (<i>Allium sativum</i>)
H	Bloat
17	Use Onion (<i>Allium cepa</i>), 0.5 kg (crushed), 10 g Ajwain (<i>Trachyspermum ammi</i>), 10g black salt and 5 g Hing (<i>Ferula asafoetida</i>) mixed with 1 litre of water, twice a day
I	Inflammation of udder
18	White alum dissolved in water and strewed over the udder before milking
J	Inducing heat in animals
19	Feeding Kalijeera (<i>Bunium persicum</i>) with Mustard (<i>Brassica juncea</i>) cake for prompting heat
K	Expulsion of placenta
20	Wetting the affected animal with Mahua (<i>Madhuca indica</i>) flower and water
21	Feeding of Jackfruit leaves (<i>Artocarpus heterophyllus</i>)
L	Retained placenta
22	Drenched with 50ml castor oil (<i>Ricinus communis</i>)
M	Heat stress
23	Extract of Shesham leaves (Indian Rosewood, <i>Dalbergia sissoo</i>) is given to animals

Conclusion

Tribal areas are in the nature's lap and dairy sector has unique potential to absorb them and creating opportunities for employment. Several studies revealed that, provision of extension and training of modern agricultural practices, facilitated tribals in adoption of innovation with relative advantage and compatibility in their own field conditions. The success of dairy farming depends largely on the effective management and performance of key areas viz.

breeding, feeding, health-care and management. However the underlying constraints in the dairy sector have always posed a challenge before the tribal farmers due to several reasons. Distant location of veterinary hospitals, lack of credit facilities for purchase of feeds, fodders and mineral mixture and non-availability of veterinary doctors and staff were the major three constraints as perceived /reported by the respondents in dairy farming. The present study concludes that there is a strong need to sensitize and train the tribal farmers about the scientific dairy farming practices through adequate extension, policy and financial support for holistic development of tribal dairy farmers in our country.

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Conflict of Interests

There is no conflict of interest.

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